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Impacts of National Forests on the Forest Resources of the South



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This publication is a supplement to Forest Resource Report 24, "The South's Fourth Forest: Alternatives for the Future," a comprehensive analysis of the timber situation in the 12 Southern States prepared by the Forest Service in collaboration with State forestry agencies, forestry schools, and other forestry interests.

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Impacts of National Forests on the Forest Resources of the South

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An average of more than a billion board feet has been harvested annually since 1969, from land that was barren in the 1920's. . . . When one sees the progress made in the span of a working lifetime, it's difficult to sum it up better than in these two words: THE MIRACLE.

--Arthur W. Hartman (1892-1982)
Assistant Regional Forester for
Fire Control, Southern Region,
USDA Forest Service

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Introduction

Ninety-two percent of the 200.3 million acres of commercial timberland in the South is non-Federal. The national forests in the USDA Forest Service's Southern Region represent 11.4 million acres of commercial timberland. Given the relatively small land base of these national forests, what impact, if any, has Forest Service administration made here? How has national forest administration influenced the revival of the South's timber resource?

While cause-and-effect conclusions are difficult to document, we can approach these questions by examining what the national forest lands in the South looked like at the time they were acquired, what has been accomplished under the agency's management, and what developments took place concurrently on non-Federal lands.

To delineate the area under study: the Southern Region's 35 national forests (administered by 15 Forest Supervisors) are located in 13 States (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana,

Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia).² Because Virginia and Kentucky did not become part of the Southern Region until 1966, references predating their inclusion will embrace only the forests in the remaining 11 States.

Unlike the large, consolidated blocks of land that make up the national forests in the Western United States, the South's national forests are characterized by fragmented ownership patterns in which private and Federal lands interface within forest boundaries. The primary reason for this is that most of the Southern Region's holdings were purchased parcel by parcel, initially for the purpose of watershed protection and later for timber production, recreation, and other uses.

There were four main sources of the lands purchased by the Forest Service in the

² The Caribbean National Forest was under Southern Region administration from 1934 to 1944 and from 1975 to the present. However, its holdings will not be discussed in this study.

South: (1) railroads, timber companies, and other holders (often absentee), who had depleted most of the merchantable timber without providing for regeneration and future growth; (2) numerous private owners of small to fairly large acreages scattered throughout the respective purchase units; (3) transfers from the Resettlement Administration and other Federal agencies; and (4) reserved public domain lands.

The Southern Region (R-8) became an organizational entity July 1, 1934. But to understand fully its forests, readers need to look back to the arrival of European settlers in the 17th century. They found stands of virgin timber blanketing all of what we now think of as "The South." The principal pine types were loblolly, slash, longleaf, and shortleaf. Sweetgum, white oak, red oak, and yellow-poplar were the prominent southern hardwoods (Hartman 1978, unpubl.).

From the colonists' point of view, the thick timber stands were as much an obstacle as a resource as they struggled to tame a wild land for farming and grazing. Therefore, they seldom salvaged more than the logs needed for homes and fuel.

The colonists observed that pines in the South shed great volumes of flammable needles³ that, under the right combination of dry weather and wind, became fuel for raging wildfires. Following the example of the Indians, settlers found that light burning would prevent the accumulation of resinous fuels that threatened their homes, fences, and livestock. It also benefited grazing, bringing fresh green grass in the spring. Similarly, gum-naval stores operators practiced light burning in the turpentine woods to reduce the danger of wildfire (Riebold 1971).

Setting fire to the forests ultimately evolved into an annual event for woods dwellers--a folkway worth noting, as it was destined to become a contributing factor in the South's wildfire problems 300 years later.

As the Nation grew over the next two centuries, so did its demand for lumber, furniture, naval stores, and other forest products. Animal logging, the primary means of meeting

³ Researchers have found more than 25 tons (ovendried weight) per acre of needles and other flash fuels in accumulations 10 years old and older under longleaf-slash pine timber stands.

that demand, inflicted minimal damage on the forest overall.

While towns were being built, migrating settlers were clearing lands for farming. If the soils became depleted, these people simply moved on to try their luck over the next horizon. In the southern yellow pine belt, seed trees left along the edges of

clearings seeded in abandoned lands.

The naturally seeded pine stands that survived the era of animal logging supported the South's gum-naval stores, small sawmills, and pole and piling operations for generations (Hartman 1981, unpubl.).

The Boom Era (1890's to 1920's)

Railroad logging spurs, steam log skidders, and double-band sawmills ushered in the South's era of large-scale lumbering in the late 19th century. While 200 years of animal logging had made little impact on the region's woodlands, two decades of mechanized operations left most of the original forests from the Atlantic Ocean to the Great Plains cut over.

The situation was simply symptomatic of the Nation's prevailing attitude during the period: America's land and resources seemed inexhaustible. Land was up for grabs, and timber was there for the taking. The government acted as disposal agent as the public domain was shared with States and homesteaders. The lumber, mining, and railroad industries benefited from free parcels of public domain, all in the cause of geographical expansion. National optimism blinded most citizens to the dangers of such land policies.

A 1933 Forest Service report to Congress, entitled "A National Plan for American Forestry," describes the

geographical movement of the lumber industry this way:

In softwood lumber manufacture, the depletion of available virgin timber supplies has marked an industrial cycle in each forest region. Local industries developed, dominated the consuming markets of the country, and declined at last so far as to be unable to meet even the regional requirements. This cycle has been characterized by a transition from light culling to clean cutting of good timber and poor alike, and by a shift from the more to the less desirable species.

The report goes on to state that softwood lumber production moved successively from New England to New York, to Pennsylvania, and to the Lake States, culminating there in the early 1890's. The industry next moved to the South, reaching its peak in 1909, when more than 16 billion board feet

was produced in the region (USDA Forest Service 1933). Perhaps typical of the bigger operations, the Great Southern Lumber Company cut 1 million board feet per day during the boom time (Hartman 1981, unpubl.).

The industrial cycle for hardwood lumber production followed much the same geographical pattern as that for softwoods. The South's total hardwood and softwood lumber production in 1909 was almost half the Nation's total (Southern Forest Resource Analysis Committee 1969).

Exploitation would run its course, in other regions and in the South in turn, before public concern for the Nation's resources was aroused. However, a first step toward assessing the status of the South's timber resource was made in 1900. The U.S. Bureau of Forestry, in cooperation with the Geological Survey of the U.S. Department of the Interior, conducted a field investigation of the southern Appalachian region. The results, submitted to Congress in 1902 by President Theodore Roosevelt, detailed widespread damage in the region's forests. The survey (U.S. Bureau of Forestry

1902) said of the logging operations:

During the past few years, [the lumberman] has cut everything merchantable. He is now beginning to extend his operations to considerable distances beyond the main lines of transportation by the construction of tramways and even cheap, short railways. Meanwhile his search for the more valuable trees has extended in advance to most of the more remote mountain coves.

There has naturally been no thought for the future. Trees have been cut so as to fall along the line of least resistance regardless of what they crush. Their tops and branches, instead of being piled in such a way and burned at such a time as would do the least harm, are left scattered among the adjacent growth to burn when driest, and thus to destroy or injure everything within reach. The home and permanent interests of the lumberman are generally in another

state or region, and his interest in these mountains begins and ends with the hope of profit.

Forest fires have been one of the great curses of this country. From the days of Indian occupation down to the present time these Appalachian Mountain forests have been swept through by fires. Some of these have preceded the lumberman, others have accompanied him, and still others have followed in his wake, and the last have been far more destructive because of the tops and other rubbish which he has left behind him scattered among the remaining growth. The aggregate damage from these fires is great.

The same report also cited cleared and abandoned farmlands as an ever-increasing problem. These lands were seldom reforested, which led to erosion and flooding. Flood damage during the year of the study was estimated at \$10 million. President Theodore Roosevelt's letter transmitting the study to Congress stated: "More good soil is now washed from these cleared

mountain-side fields during a single heavy rain than during centuries under forest cover." The President recommended the creation of a national forest reserve, to protect both the beauty and the economic value of the region (U.S. Bureau of Forestry 1902).

The idea of setting aside eastern forest reserves was gaining the support of an influential group of Americans by the time of the survey report. Gifford Pinchot, Chief of the USDA Division of Forestry since 1898, led them in submitting nearly 50 bills to Congress between 1900 and 1910 to authorize creation of an Appalachian Forest Reserve (Buxton and Crutchfield n.d.). Their efforts culminated in the 1911 Weeks Law authorizing the government to purchase lands for the purpose of protecting the headwaters of navigable streams.

Additional studies were made during that decade; thus, the Forest Service had ample information and opportunity to decide before the first meeting of the National Forest Reservation Commission just what areas to recommend for establishment at the outset of the Weeks Law acquisition program.

An important side story: The conservationists of this period, who were not in agreement on the role of forest reserves, were divided into at least two distinct factions, the preservationists and the utilitarians. The former favored preserving most of the Nation's scenic forests just as they were, never to be exploited by people. The utilitarians favored continued economic use of the forests, but under the careful protection of the Federal Government. (The conservation movement's most prominent leaders, Pinchot and President Roosevelt, favored the utilitarian philosophy.) While these factions worked together for the overriding national interest and the eventual passage of the Weeks Law, advocates of the opposing views continued to complicate national forest management in the years to come (Buxton and Crutchfield n.d.).

The first national forests in the South were formed by withdrawals from public domain. In Arkansas, the Arkansas National Forest was created in 1907 (and renamed the Ouachita in 1926) and the Ozark National Forest, in 1908. Florida's Ocala and Choctawhatchee National

Forests were created in 1908 also.

At the time of proclamation, the Arkansas covered 1,073,955 acres in the west-central part of the State. According to the examiners' report (Record and Reynolds 1907), the lands were "irregular scattered areas comprising mainly the tops of unalienated mountain ranges." (The term "unalienated" means "uninterrupted by privately owned parcels.") The forest cover was of three common types: ridge, slope, and river bottom.

Tree species found in the ridge type, occupying the crests of the ridges and some of the "poorest knolls and foothills," were blackjack oak, red oak, black locust, chinquapin, hickory, wing elm, cherry, buckeye, and shortleaf pine. Small, short, and scrubby, these trees were valuable only for firewood and the protection they afforded the steep slopes.

The slope type bore the best timber, with the highest quality trees near the base and lower quality trees on land ascending toward the ridgetops. Shortleaf pine of generally good quality made up the bulk of the forest on

the south slopes. The north slopes supported a greater proportion of hardwoods, principally white oak. According to the report: "the timber [was] of fair to good quality, though none of the trees [were] extremely large."

Finally, there was the river bottom type, most of which had been homesteaded. Principal species were sycamore, black and red gums, willow oak, black walnut, holly, dogwood, red and sugar maple, cherry, elm, and hickory. The stands were usually quite dense with considerable undergrowth.

Extensive lumbering in the area provided an important source of employment for local residents. However, "no care [was] taken of cutover lands," the report stated. "It is highly desirable that this area be set apart; otherwise there will be no timber remaining within a few years" (Record and Reynolds 1907).

The Record and Reynolds report also cited woods burning as a constant threat to the forest:

The fires are rapidly changing the density and character of the stand. Sixty years ago

the timber consisted of large trees set well apart. . . . There was a heavy growth of good grasses for ground cover. Now much of the available space is being crowded by sprouting hardwoods.

The early settlers put out fire "to improve the range." The light-seeded hardwoods seeded in on the bared surfaces and those hardwoods which were burned off began to sprout. The fires continued and the sprouting increased. Some settlers say they burn now "because the brush is so thick." Others continue the practice simply because their fathers did it. Some are amenable to reason, but the majority are not, in this respect.

This indepth description of the South's first national forest is intended to convey that while the land taken from the public domain was an important watershed and had great potential for timber growing, it certainly was not untouched, virgin forest.

The Arkansas' sister forest was the Ozark in northwest Arkansas, situated on the headwaters of the White

River and tributaries to the Arkansas River, both of which were navigable. The Ozark's original 700,000 acres included 30 townships, and only about 45 percent of the land within forest boundaries was government owned (Reynolds 1907).

Like the Arkansas, the Ozark consisted of ridge, slope, and river-bottom lands. Early descriptions indicate that lands in the ridge type supported scrubby growth of black oak, post oak, and blackjack and white oak, with few trees over 3 inches in diameter. But despite their size, these trees were important in restraining erosion.

The better timber--shortleaf pine, white and red oak, shagbark, white elm, cherry, and black walnut--grew on the slope type. According to the examiner's report, "All the best of the merchantable black walnut and cherry was removed from this country eight years ago [1899] by agents of northern companies, who had the timber thoroughly searched for these woods" (Reynolds 1907).

White oak remained, to become the most prevalent

species, the strongest in reproduction, and the most valuable. (A memorandum dated November 17, 1913, stated that the Ozark National Forest comprised the largest protected body of hardwood timber in the United States, mainly of white oak.)

The Ozark's river bottoms, formed of rich, deep alluvial soils and sporting the heaviest and most varied timber growth to be found in the area, were almost entirely in private ownership for agricultural use.

Summing up the Ozark's lands, the examiner (Reynolds 1907) introduced the subject of fire:

We have in the proposed Forest an over-mature forest of hardwoods composed largely of white oak, pin oak, and red gum, with a lower story, in many places very dense, composed very largely of sprouts from seedling individuals of the principal species. There seems to be little doubt that the sprout reproduction, as in the case of the proposed Arkansas National Forest, is due largely to repeated surface fires.

Elaborating on the burning problem, the examiner said,

The early settlers found here a rather open mature forest with very little undergrowth, and plenty of excellent grass. "To improve the range" they regularly burned it over. Much mature timber was killed or injured, and the seedling reproduction began to multiply rapidly by sprouts from the burned stumps. . . . The people continue to burn in order to keep the thickets down enough for stock to get through. But every fire multiplies the young growth and at the same time makes it more scrubbyThe fires are so constant, that erosion is continual. . . . There is hardly a section which has not been burned over from one to thirty times in the last 40 years. Consequently there is hardly any forest floor.

As a parting warning, the examiner advised,

Fires will undoubtedly cause much trouble. The country is full of people who honestly believe that burning

improves it. Also these people are very much accustomed to doing as they please, and will object to restraint of any kind unless they can be won from the first by tactful and straightforward treatment.

In Florida, the Ocala National Forest was formed from a "Great Scrub" area never staked by homesteaders, despite heavy settlement all around it. The classification studies emphasized that this land was inappropriate for agricultural purposes. Its original 146,045 acres were 97.7 percent sand pine and 1.1 percent scattered tracts of longleaf. The classifier (Hill 1916a) speculated that Florida's supply of longleaf was being slowly but surely depleted--by extensive logging and by "rapid and destructive methods" used in working the trees for turpentine--and that as longleaf declined, the sand pine would increase in usefulness and value.

The Choctawhatchee National Forest was also formed from public domain lands upon which no homestead claims had been placed, apparently because the land was unsuitable for agriculture.

Of its original 157,718 acres, 97 percent was classified as timberland. This consisted of longleaf yellow pine with undergrowth of different species of oak. There was some spruce pine along watercourses, mixed with other species, pure near the coast, but not plentiful enough to be of commercial consequence (Hill 1916b).

The Choctawhatchee and the Ocala were consolidated by Presidential proclamation on April 17, 1911, and became the Florida National Forest.

One other tract of public domain land in the South was destined to become national forest: 152,960

acres in Lawrence and Winston counties in north Alabama, withdrawn from the public domain in 1913. This acreage became a purchase unit which, augmented by Weeks Law purchases, formed the Alabama National Forest in 1918. Its name was changed to the William B. Bankhead National Forest in 1942.

The lands withdrawn from the public domain constituted the limited holdings of the Forest Service in the South when conservationists won passage of the Weeks Law in 1911, opening the door for purchase of national forest lands.

National Forest Establishment, 1911-33

Acquisitions Under the Weeks Law

The Act of March 1, 1911--commonly referred to as the Weeks Law--represented a radical departure from the traditional American policy of private ownership of natural resources and their exploitation for private profit. The concept of Federal public administration of a great natural resource in the public interest went on trial. Progress made by the pioneer foresters was accomplished against difficult odds, and despite public indifference or even antipathy (USDA Forest Service 1933).

In the context of this prevailing sentiment, the act authorized creation of a National Forest Reservation Commission to select and purchase lands for the expressed purpose of watershed protection. In 1912, purchases were limited to areas in the southern Appalachians and White Mountains where the forests were believed to have an impact on the protection of important navigable streams.

The 1912 Report of the Commission (U.S. Congress, Senate 1912) addressed the question of how much land would be needed to accomplish the objective of watershed protection. The commission recommended that in few cases, if any, would it be desirable to purchase an entire tract since its value for agriculture or other purposes might exceed its value as forest. "Probably the lands ultimately to be required by the Government need not exceed from 50-75% of each of the watershed areas," the report stated. Wise selective purchases would ensure protection and permanence of the forest, and these tracts could become demonstrations of practical forest conservation.

The goal of establishing demonstration forests was more explicitly worded in the Commission's 1915 report (U.S. Congress, House of Representatives 1915):

The lands which are being acquired in these areas will become demonstration forests

and centers of influence for forest protection, production, and utilization. Their influence in these directions is already beginning. Although small in area as compared with the region in which they are situated, their influence will be far-reaching in leading private owners to protect their timberlands from fire and to practice forestry.

In addition, the 1915 report stated:

It is not enough that these forests serve simply to protect the watersheds of the navigable streams. Their usefulness extends in other directions which are of such importance as to make the forests as their development goes on an asset of greater and greater value to the Nation. They should be constantly developed. Their stands of timber should be improved, their soils made more productive, their remote resources made accessible, the water supplies kept pure and at maximum

volume, and they ought to be so managed as to serve the public advantageously for recreation and health purposes.

The Commission emphasized that "at the bottom of all increase of the resources is protection from fire." As quickly as they were acquired, lands were placed under a forest officer and "protection force," and efforts were undertaken to rally the local citizens against fire, "this worst of all enemies to the forest" (U.S. Congress, House of Representatives 1915).

Early in the game, the National Forest Reservation Commission was continuously requested to exercise the right of eminent domain in acquiring lands. However, the Commission believed that condemnation would result in a great deal of litigation and fail to accomplish the desired goal of educating the public to the necessity of conserving the forests. They decided to employ condemnation only when necessary to perfect title or when, in the face of great public need, it would be impractical to obtain lands by purchase.

In 1912, the Forest Service was designated to examine lands for purchase under the Weeks Law. The commission considered the agency's recommendations, approved or disapproved the purchase, and fixed the price for approved lands.

During the first 5 years of the Weeks Law program, purchases in what is now the Southern Region were confined to purchase units established in 1911 and 1912 in the Appalachian States. Those mentioned in the 1912 report were:

1. A tract of virgin timberland situated in Fannin, Union, Gilmer, and Lumpkin Counties in Georgia. The watershed was the Toccoa River, a tributary of the Tennessee.

2. A group of tracts in the Massanutten, VA, area, comprising 19,322 acres situated in Page and Rockingham Counties on the Shenandoah River.

3. A group of tracts in the Mount Mitchell area in McDowell County, NC, in the upper watershed of the Catawba River.

4. A group of tracts in the Nantahala area consisting of 27,815 acres in Macon and Swain Counties, NC,

on the watershed of the Nantahala and Little Tennessee Rivers. Of this tract, 20,000 acres supported virgin timber of excellent quality, averaging 4,500 board feet per acre. The remaining lands were cut over and in part virgin.

5. A tract containing 24,900 acres on the James River watershed in Rockbridge, Bedford, and Botetourt Counties, VA.

6. In the Smoky Mountain area, a group of tracts containing 59,213 acres in Blount and Sevier Counties, TN, in the headwaters of Little River, a tributary of the Tennessee.

7. Three groups of tracts in the White Mountain area totaling 33,800 acres.

8. Two tracts comprising 33,619 acres situated in Johnson and Sullivan Counties, TN, and in Washington County, VA. These lands were in the watershed of the Holston River, which forms the extreme headwaters of the Tennessee.

These were all cutover lands.

Of the lands (within present Southern Region boundaries) approved

during the first 5 years, 28 percent supported virgin timber. The remaining lands were culled, cut over, or abandoned farmlands. These lands cost an average of \$5.65 per acre during this period (Paxton 1950).

In 1916, sufficient land had been acquired to establish the Pisgah National Forest in North Carolina. Additional lands were approved in Alabama and Arkansas in 1917 and 1918, respectively. A large part of the lands in Alabama carried valuable stands of sawtimber, much of which was virgin. In 1918, the Alabama National Forest was proclaimed, made up of Weeks Law purchases and land that had been withdrawn from the public domain in 1913. The Ozark and Arkansas National Forests were enlarged the same year, and the Shenandoah (now part of the George Washington) and the Natural Bridge (now part of the Thomas Jefferson) were established in Virginia (Paxton 1950).

"Virgin timber" was a condition classification not clearly defined in most instances. The narrative comments of the land examiners at the time suggest that many of those stands had been high-graded for specialty

products, particularly the large, high-quality walnut, cherry, oak, and white pine. In some cases, stands of mature trees having over 2,500 board feet of mature, merchantable timber per acre were considered virgin.

Other tracts that had good stands of so-called virgin timber at time of examination were purchased subject to reserved cutting rights. The 80,000-acre Vanderbilt tract, now a part of the Pisgah National Forest, was one of those. From 1890 to 1912, it was managed for the Vanderbilt family by foresters Gifford Pinchot and Carl A. Schenck, founder of the first forestry school in America. During the first 5 years after its acquisition by the government, 70,000 acres in the Pink Beds area were logged under cutting rights held by the Carr Lumber Company.

Frequent wildfires were a major factor affecting the condition of stands of virgin timber. The effects of high grading, disease, insects, and fire combined to make many trees defective, particularly in the hardwood and mixed pine-hardwood types.

As of 1918, the preponderant national forest

acreage was in the Appalachian Mountain hardwood type. However, there were shortleaf pine on the Ouachita and Ozark, small areas of mixed shortleaf and loblolly pine on the Alabama, and longleaf and slash pine in parts of the Choctawhatchee and Ocala (both of which contained large areas of sand pine and scrub hardwoods).

In 1920, four more forests were created in the Appalachians: the Boone, now part of the Pisgah; the Nantahala in North Carolina, South Carolina, and Georgia; the Cherokee in Tennessee; and the Unaka in North Carolina, Tennessee, and Virginia.

At the close of the fiscal year in 1924, lands in the Appalachian units were still bringing nearly \$6 per acre, indicating that they were of high quality. Those in Alabama brought about \$4.70 and those in Arkansas, about \$3.45 (Paxton 1950).

Was the public benefiting from the National Forest Reservation Commission's activities? Commission reports between 1914 and 1918 presented a great many accomplishments supporting the assumption

that their work did indeed benefit the public.

Fire protection was mentioned as one of the greatest benefits. For example, in 1913, only 3,600 acres of government-owned lands were burned over; in prior years, it was common for 10 to 20 percent of these areas to burn over in a season. Cooperation with State and local officials and with other landowners was increasing. And timber owners were beginning to follow the example of the government in limiting the cut to save young trees.

The 1914 report stated that rangelands were being utilized, and that the general public "greatly appreciated" the opportunity to go into the highlands for health, pleasure and recreation" (U.S. Congress, Senate 1914).

Another local benefit was established in 1914: the Forest Service was directed to return 25 percent of national forest proceeds to the counties for school and road purposes. The agency was to spend an additional 10 percent on roads and trails within the forests.

During the early years of the southern national

forests, timber harvests were relatively small, reflecting the poor condition of the timber stands, the limited markets for timber, and sales policies emphasizing support of the local economy. The first timber sale (1909) on the Ouachita National Forest was for \$32. By 1917, however, timber sales covering as much as 33,000 acres reportedly were made on the Ouachita.

The volume actually cut prior to 1923 is not known, but during the early years, the cut exceeded growth on some units. Overmature, defective, and disease- and insect-infested trees were harvested to improve stand condition, reduce losses from mortality, and aid establishment of new tree growth on these previously abused forest lands.

Terrible floods in portions of Appalachia during summer of 1915 further supported the apparent wisdom of government ownership and jurisdiction of the mountain areas. Local opinion, at least according to the National Forest Reservation Commission, was almost unanimous that the Federal forests were of great value in retarding the flood waters

and holding the soil in place on the slopes and in coves.

Overall, the members of Commission were satisfied that during its first decade, the experiment in Federal ownership was indeed successful.

The Clarke-McNary Amendment of 1924

While the Weeks Law provided the States with some assistance in fire control, its provisions were not very effective. In 1924, it was amended by the Clarke-McNary Act. While continuing to authorize the purchase of lands for stream protection, the new law had two important new facets: financial assistance that helped many State forestry organizations get started, and authorization to purchase lands with the objective of timber growing.

This latter aspect of Clarke-McNary opened the possibility of purchases in the southern pine belt of the South Atlantic and Gulf States, where the need for constructive public action in forest conservation was becoming more obvious with each passing year.

In anticipation of passage of the Clarke-McNary Act, the Forest Service had already made field examinations in Alabama, Georgia, Louisiana, Mississippi, and Texas. Prospective areas in southeast Oklahoma were also located.

In 1930 and 1931, the Forest Service acquired two more national forests: the Kisatchie, in the cutover longleaf pine lands in Louisiana, and the Osceola, in the naval stores belt in Florida.

Management: Establishment to New Deal

During the period 1911 to 1933, the Nation took at last the first steps to reclaim the timber resource and establish a system of national forests in the South. Management during this period was primarily custodial, however. Fire protection was the primary concern. Roads, trails, and telephone lines were built to improve access for fire control and for public recreation. Game preserves were set aside, with the assent of the States, and public campgrounds were built.

With the exception of lands reserved from the public domain, most of the acquired lands were cut over, burned over, eroded, understocked, and of relatively low site quality. Most stands were uneven-aged because of previous cutting practices and fires. Even-aged stands were found on abandoned homesites and some sites of intense burns. Generally, stands of merchantable-sized trees were comprised of mature, often decadent trees left from earlier cuttings, fires, and the ravages of chestnut blight.

Timber sales were another important management activity, but on a very modest scale. Management objectives were to improve the condition of the forest and, consistent with annual growth, to assure dependent industries a supply of timber. The National Forest Reservation Commission report of 1923 summed up the program:

The chief object in selling timber is to improve the condition of the forest. To this end, much time . . . has been devoted to the preparation of cutting plans. Such plans outline how much timber

may be cut, where sale areas may be located, which areas should be cut first, etc. In preparing these plans, the needs of local industries dependent on the forests are always kept in mind, and it is the aim, as far as possible, consistent with the annual growth of a forest, to assure industries an annual supply of timber with a view to their permanent operation.

. . . The majority of the lands have been acquired in a cutover condition, or else have been culled of the choicest timber. It, therefore, becomes necessary to dispose of a large amount of comparatively low-grade low-growth timber in order to liberate the young timber and replacement already established and permit its rapid development.

. . . As a result of the policy followed, the condition of the purchased lands is continuously improving both following cuttings designed to remove defective, mature and overmature timber,

thereby releasing thrifty young timber, or in creating conditions favorable for restocking. As a result of preventing fires the acquired lands are rapidly being stocked with seedlings, assuring not only a second crop of timber but a much more even run-off of water and reduced erosion (U.S. Congress, Senate 1923).

Public attitudes, the generally understocked and abused condition of the forests, and the watershed protection and other management objectives for the new national forests combined to produce a situation that called for a variety of cutting practices: sanitation and salvage, economic selection (high grading), and cull removal and release cuttings. These hardly fit any of the classic silvicultural systems. But, perhaps for lack of a better name, they were called "selective cutting." This term has been described as "cutting the obviously defective and leaving the apparently sound."

Selective cutting gained a prominence during the period that would haunt forest managers 40 years

later, when even-aged management (and the associated clearcutting) on national forests became a critical public issue.

By 1923, the Commission felt comfortable in strengthening earlier evaluations of the national forests' value as demonstration areas. In the report of that year, the Commission asserts:

It is believed that one of the most substantial contributions which the eastern national forests are at present making and will continue to make toward assuring a future timber supply is their value as demonstration forests in directing the effects of private owners of forest land. Owners of . . . privately owned lands within the purchase units are now protecting their lands and holding them with the object of securing future cuttings of timber from the second growth. Undoubtedly owners of much additional land located outside the boundaries of the purchase units are doing likewise, thus

following in a general way the practices of the Government in the management of the National Forests.

The adoption of this policy on the part of private owners, all of whom hold their lands as sources of timber for the supply of mills, is an eloquent tribute to the methods which are being employed by the Government and which they have at least in part adopted.

As the decade of the 1920's drew to a close, 11 national forests had been established within the boundaries of what is now the Southern Region. At the end of 1930, national forest lands covered 3,359,806 acres, and the annual timber harvest had risen to nearly 85 million board feet. The area annually burned had been reduced to 1 percent of the net national forest acreage. These were exciting resource management accomplishments, and the greatest period of national forest establishment in the South was at hand.

The New Deal Years

The onset of the Great Depression in 1929 prompted recognition of the necessity for a national inventory of resources and a change of policy in their management.

In 1933, the Forest Service submitted to Congress a 1,651-page, indepth analysis of the Nation's timber resource: "A National Plan for American Forestry," commonly referred to as the Copeland Report (after Senator Royal S. Copeland, who introduced the Senate resolution requesting it).

The Copeland Report (USDA Forest Service 1933), while acknowledging the progress made under the Weeks Law and Clarke-McNary Act acquisition program, nevertheless painted a grim picture of the South's timber resource overall. Some of the important points:

1. The southern pineries had been heavily cut, and fire had run rampant thereafter. (Between 1890 and 1933, the number of woods fires in the South exceeded 100,000 annually, with the area burned

estimated at several million acres every year.) The forest values left after "cut out and get out lumbering [were] very little."

2. Many thousands of acres of pine lands were deficient because of failure to leave sufficient seed trees. Skidder logging of old-growth longleaf stands left few trees. Slash fires completed the destruction.

3. The mixed shortleaf, loblolly, and hardwoods stands of the upper Coastal Plain and lower Piedmont, particularly in Alabama, Mississippi, Louisiana, and Arkansas, had been subjected to first the removal of the pine sawtimber, later the pine poles, and finally the pine pulpwood. The remaining stand consisted of poor and defective hardwoods, chiefly low-grade oak and gum.

4. The commercial forest area in the South was estimated at 190.8 million acres; 43.5 million acres were characterized as barren or poorly stocked, "as a result of fire and mismanagement." An additional 19 million acres

were classified as submarginal for agriculture.

5. Tax-delinquent commercial forest land in eight Southern States (Florida, Arkansas, Louisiana, Mississippi, Texas, Oklahoma, Alabama, and Georgia) during the first 3 years of the Depression amounted to about 13.7 million acres.

6. The South had more than 100 million acres of cutover pine land capable of producing from one-half to 1-1/2 cords of wood per acre per year if given proper forest management. This would be a sufficient volume to match the pulpwood consumption of 1933 five or six times over.

It is ironic that the Depression directly contributed to reclaiming the South's cutover, burned-out, and farmed-out lands. President Franklin D. Roosevelt's New Deal anti-Depression measures resulted in: (1) unprecedented funding for national forest land acquisition, and (2) unprecedented labor to perform reforestation work and suppress fire.

According to National Forest Reservation Commission reports, appropriations for

the years 1911 to 1932 ranged between \$1 million and \$2 million, with the exception of the year 1917 (\$3 million) and the years 1923-25 (which averaged about 1/2 million dollars). Then in June 1933, the President allotted \$20 million of New Deal funding for purchase of forest lands. Additional allotments brought that total to \$45.9 million by August of 1935!

The Commission established 15 new purchase units in the South the first year and 5 more the following year.

Only 2,132,387 acres had been purchased in the South between 1911 and 1933. With the allocation of increased funds under the New Deal, the total area acquired or approved for purchase as of January 1, 1936, was 6,474,294 acres.

The Copeland Report's recommended program for the South suggested purchase of cutover and submarginal agricultural land, leaving the better lands to private ownership.

According to a Forest Service memorandum (Girard 1936, unpubl.) dated January 24, 1936, purchase policy was to achieve the following goals:

1. To create conditions most favorable for the redemption of Federal responsibilities within areas in other than Federal ownership.

2. To round out and consolidate existing Federal holdings in established National Forest units so as to promote their most efficient and economic protection and management and the highest degrees of industrial and social use.

3. To establish and purchase additional forest units . . . provided the facts clearly indicate that private interests would not be handicapped, and the public would be more fully protected.

To carry out this program, the purchase of the following types of land would be recommended by the Forest Service:

1. Lands necessary for watershed protection and flood control.

2. Lands necessary for recreational use.

3. Cut-over and tax-delinquent lands

which would not receive any care or protection if left in private hands.

4. Nonoperating blocks of timber; areas that are not economically ripe but which because of pressure for early liquidation, due to high carrying charges, may be destructively and wastefully operated if left in private ownership.

5. Blocks of merchantable timber not yet opened up but feasible of operation--where such purchases are necessary to prolong the life of established industries; make practical the application of sustained yield and thus stabilize established communities.

6. Blocks of operating stumpage which are being destructively cut but are sufficient in size to make a practical sustained yield operation if under Federal management. These areas will also be largely demonstration forests.

Of course, there were critics of the acquisition program. One of the more prominent

was Austin Cary, well known as a sort of roving extension forester and then recently retired from the Forest Service. Cary's main criticisms and the Forest Service responses were summarized in the Girard memorandum cited above:

1. Cary: Areas of forest land of low producing power are passed by, and tracts of superior types are sought from individuals who, now hard-pressed financially, would have held on had some reasonable form of credit been extended to them.

Forest Service response: It is true that the government has in several cases in the South purchased some of the better tracts. When large areas of both good and poor forest lands are offered for sale, it is just plain good business to pass up the poorer tracts and purchase the better ones. The primary reason for purchasing the better tracts is to establish units in which immediate sustained yield will be feasible and to use these areas primarily for demonstration forests

by putting sustained yield operations into effect.

2. Cary: The Federal Government will compete with private owners, thus discouraging the practice of forestry by such owners.

Forest Service response: In no case has the Federal Government tried to purchase areas that are now under sustained yield management. In the regions of the United States where the government now owns a very large percentage of all forest land, the timber sale policy followed by the Forest Service in these regions has not resulted in any general complaint from private timber owners.

3. Cary: The purchase program has been characterized in some cases by haste, extravagance, and ruthlessness.

Forest Service response: . . . There may be a few isolated cases where Forest Service acquisition officials over-stepped

their authority, but for the general program these accusations do not apply.

The President's allotments for acquisition were the direct result of his desire to establish meaningful work for his newly formed Civilian Conservation Corps. The Corps was Roosevelt's solution to two national problems: high unemployment among young men aged 15 to 24 (the so-called "teenaged tramps of America"), and the Nation's dwindling natural resources. With shovels and picks, his Tree Army would wage war against erosion, wildfire, and depletion of America's forests.

According to the 1933 report of the National Forest Reservation Commission, the Corps could be most effectively employed on national forests; but in the East,

the incomplete condition of the national forests, with thousands of privately owned properties intermingled among the Federal holdings, militated against the most complete and economical use of the Corps. As an alternative to transportation of

many thousands of men to States remote from their points of origin, the prompt purchase of remaining private lands within the national forests was a logical course (U.S. Congress, Senate 1933).

With the prospect of new lands to administer and labor to develop it, the Forest Service divided its Region 7 to form the Southern Region (R-8) on July 1, 1934. The new region's 11 national forests totaled only about 4.3 million acres in 11 States: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, and Texas. (Puerto Rico was added to the Southern Region the following year.)

The Southern Region's original forests were the Alabama, Cherokee, Choctawhatchee, Kisatchie, Nantahala, Ocala, Ouachita, Osceola, Ozark, Pisgah, and Unaka.

Two years later, in 1936, the Southern Region experienced its greatest year of expansion: 15 new national forests were proclaimed within its boundaries. They were the Conecuh and Talladega in

Alabama; the Apalachicola in Florida; the Chattahoochee in Georgia; the Bienville, DeSoto, Holly Springs, and Homochitto in Mississippi; the Croatan in North Carolina; the Francis Marion and the Sumter in South Carolina; and the Angelina, Davy Crockett, Sabine, and Sam Houston in Texas.

The lands acquired for these forests have been characterized as "the lands nobody wanted" (Shands and Healy 1977). In general, they were cutover, abandoned, and/or tax-delinquent properties, purchased from willing sellers.

The Homochitto, for example, was comprised of areas that were culled over, leaving only the defective material and inferior species. On that forest, timber stand improvement work was at first confined to the removal of unmerchantable material. The abandoned fields and heavily cut areas were naturally restocking, so that early planting was confined to fields where erosion control was needed.

On the DeSoto, more than half the acreage was classified as "less than 10-percent stocked," so at first timber management

activities were confined almost wholly to the reforestation of denuded forest land. Between 1934 and 1938, the Civilian Conservation Corps planted seedlings of 13.6 million longleaf pine, 10.2 million slash pine, and 845,000 loblolly pine. Total acreage planted was 25,065. Early timber sales were in negligible volumes, mostly small sales of pine and hardwood sawtimber. Pine distillate wood (virgin longleaf stumps) was the only product removed in any appreciable volume (possibly a total of 12,000 tons).

The Sumter's lands were mostly abandoned, overcultivated cotton fields with some naturally seeded loblolly and shortleaf pine. Much of it was purchased in small tracts of less than 300 acres. A policy statement written in 1938 provided for improvement cuts and thinnings in pine stands. Diseased trees and poor-risk trees were marked along with trees to be thinned out of overly dense stands. Markets were available for both pine pulpwood and sawtimber.

The Francis Marion was made up of large tracts from lumber companies. Mostly cut over, the lands

had been burned annually. An early timber management plan stated: "One can see for miles across lands, barren except for remnants left from logging." The Corps established about 70,000 acres of loblolly seedlings within a few years.

Likewise, the Chattahoochee was purchased mainly from large lumber companies after the land had been cut over. Early management practices consisted of protecting the land from fire and releasing desirable seedlings and saplings on the cutover land. Most stands contained several age classes because of previous management. Even-aged stands were found only on abandoned farmland or pastures.

The preceding paragraphs describe typical conditions on the new national forests in the South.

The 1936 Annual Nursery and Planting Report showed 535,765 acres of national forest land in need of planting--mostly pine sites in the Coastal Plain and Piedmont forest and in Arkansas (USDA Forest Service 1985b). In 1935, nearly 1,200 acres were planted. With the anticipated

increase in funds from economic recovery programs and Civilian Conservation Corps labor, the Southern Region had already taken action to increase the production of planting stock for national forest and other reforestation projects.

Specifically, the Robert Y. Stuart Nursery, constructed on the Kisatchie in 1934, was enlarged to increase production capacity from 10 million trees annually to 42 million. A new nursery, the W.W. Ashe on the DeSoto National Forest, produced 20 million trees in 1937 (U.S. Congress, Senate 1936). These two nurseries, along with the Forest Service Nursery in Russellville, AR (where annual production capacity was 3.2 million trees), were producing primarily longleaf, slash, loblolly, and shortleaf pine.

In 1941, the three Forest Service nurseries produced over 53 million trees. (Other planting stock needed for the national forests was obtained from private or State nurseries.) That year, 62.2 million trees were planted on 60,000 acres, mostly pine sites in the Coastal Plain forests. This effort constituted the largest planting program ever

undertaken by the southern national forests.

The Civilian Conservation Corps program was destined to exist a brief 9 years, from 1933 to 1942. Although it brought unprecedented money and labor to the region, the timber resource apparently was not getting the attention that the Regional Forester felt it should. In his letter (USDA Forest Service 1938a, unpubl.) to forest supervisors dated March 21, 1938, Joseph Kircher wrote:

During recent years, I have found it necessary to nag many of you into making sales and giving high priority to timber management work. I now desire that you have either an approved management plan or a policy statement for every individual unit completed and in shape for approval by me by July 1, 1938.

Many working circles already had timber management plans or policy statements, but most of them predated the rapid expansion of the national forests in the early 1930's. Most units responded admirably to the 3-month deadline, but not quite 2

years later--on February 1, 1940--the Regional Forester sent another ultimatum to 13 working circles still delinquent. By June 30, approved plans were in effect on 90 percent of the national forests in the region (U.S. Congress, Senate 1940).

As Civilian Conservation Corps operating funds began to taper off in the late 1930's, the Regional Forester reiterated his concern for timber management work. In 1939 he wrote the Forest Supervisors (USDA Forest Service 1939, unpubl.):

Now that most of the essential fire and administrative improvements have been completed, increased attention may be given to forest culture and the improvement of the productivity of timber stands. There are three phases of this work; namely, (1) timber stand improvement through release cuttings, (2) timber quality improvement through pruning, and (3) erosion control.

Whether it was the Regional Forester's prodding or the unprecedented opportunity

to improve the condition and growth of the timber resource, timber management activities produced some notable results, including the planting accomplishments cited above. Also by the end of 1941, and the beginning of World War II, the annual timber harvest had more than quadrupled in a 10-year period, to 193.5 million board feet. Timber receipts that year were \$1,146,162.41 (USDA Forest Service 1985a, unpubl.)

With the expansion of timber stand improvement work during the Civilian Conservation Corps era, and the beginning of sale-area betterment work with Knutson-Vandenburg Act⁴ fund came complaints from the southern Appalachian forests and the Ouachita in Arkansas that the work was destroying the food supply of game animals and birds.

A study at the Southern Appalachian Experiment Station concluded that the current policy of restricting the cutting to trees actually overtopping potentially more valuable trees would cause little real harm to wildlife. Specific recommendations were made for leaving some den trees and mast-bearing

trees and vines. Also mentioned was the need to vary timber stand improvement policy in accordance with the forest type, stage of forest succession, and wildlife and other resource management objectives to achieve a balance of all forest resources. These recommendations were forerunners of the more sophisticated timber-wildlife management coordination guides developed 30 years later.

Contributions of the Civilian Conservation Corps

Most Forest Service retirees who witnessed this era in the Southern Region agree that the single greatest contribution to reclaiming the South's forest lands was the formation of the Civilian Conservation Corps. Some, like

⁴The Knutson-Vandenburg Act of 1930 authorized the Secretary of Agriculture to require any purchaser of national forest timber to make deposits of money (in addition to payment for the timber) to cover the cost of reforesting a sale area and for sale-area betterment (such as timber stand improvement). The act was later amended to include costs of wildlife habitat management on the sale area.

Arthur W. Hartman--who directed the Corps in the Region and later became Assistant Regional Forester for Fire Control--say there would have been no Southern Region had there not been a Civilian Conservation Corps.

By any assessment, the Corps changed the southern landscape. As quickly as the Forest Service acquired new land, Corps camps were established and put to work to develop it. At the peak of the Corps program, there were 311 forestry camps in the South--125 on national forests and 186 under State foresters. Progress in forest reclamation directly paralleled the growth of the Corps program as enrollees planted million of trees, fought fires, battled erosion, and built roads, bridges, and recreation areas.

The Civilian Conservation Corps opened the door for more intensive forest management because professional foresters were hired to direct reclamation projects. As the number of foresters in the South increased, the understanding of southern woods grew proportionally.

Accomplishments within the first 2 years of the

program were astonishing. Some highpoints:

1. By 1935, the National Forest Reservation Commission was able to report that, because of the Corps, lands acquired prior to the initiation of the Emergency Conservation Work Program were almost completely covered by timber stand improvement work, and a very large part of the newly acquired lands likewise had been covered.

2. The Southern Region's fiscal year 1935 receipts were \$192,894. Of that, \$187,467 represented the revenue from the sale of sawtimber, naval stores, and other forest products.

3. The 1935 report also stated that road building and fire control improvements were being made, and that special emphasis on recreational developments had begun. Improved access meant better fire protection and increased recreational use of forests. In fact, recreational use of the Southern Region's forests tripled during the fiscal year ending June 30, 1935 (U.S. Congress, Senate 1936).

The Corps' contribution to fire control was immense. By 1937, there had been a substantial reduction in the occurrence of fires and acreage burned. Progress in prevention work, better organization of fire forces, and additional detection and communication facilities contributed to the improved record.

That year, 62 percent of the fires and 87 percent of the area burned were on the Louisiana, Texas, Mississippi, and Alabama national forests. All these forests were relatively new, and the record reflected that the more established forests were effectively reducing fire occurrence. Fire records for 1937 showed that only three forests in the Southern Region exceeded their fire objectives in number of fires and acreage burned.

When wartime demands for labor ended the Civilian Conservation Corps Program in 1942, the final statistics for national forests in the Southern Region were impressive:

1,629,218 acres of forest
stand improvement
273,806 acres of field
planting and seeding
11,225 miles of truck trails

6,028 miles of telephone
lines
1,968 vehicle bridges, 103
foot/horse bridges
197 lookout towers, 64
lookout houses
36 shelters
248 barns
66 cabins
146 dwellings
496 equipment or storage
supply houses
205 latrines
571 other buildings
1,497 sewage and water
disposal systems
6,169 signs, markers,
and monuments
412,069 square yards
treatment of gullies
909,704 square yards
seeding and sodding of
gullies

The War Years

The years 1941-45, during which the United States was at war, may be characterized as silent years in terms of forestry in the South.

With the beginning of World War II, labor and funds were diverted to more urgent needs. Cutting budgets were revised upward, with emphasis on getting out the timber needed to meet the demands both at home and in the war effort. Timber stand improvement and planting during the war

years declined to the lowest level since the beginning of the Civilian Conservation Corps Program in 1933. In 1944, no planting or timber

stand improvement work was reported; in 1945, only 252 acres of regeneration work was accomplished.

Summary of National Forest Timber Resources and Trends, 1911-45

We have seen that little if any forest management existed in the South prior to passage of the Weeks Law of 1911 and the Clarke-McNary Act of 1924. These two pieces of legislation, spawned by the conservation movement of the early 20th century, brought the first National Forest System presence into the Region.

Set against the obstacles of the prevailing exploitative mood of the Nation, and the 300-year-old southern folkway of annual woods burning, the National Forest Reservation Commission embarked on the revolutionary idea of acquiring Federal forest reserves for the purposes of watershed protection, timber growing, and demonstration for private landowners.

Staffing was limited, as was the number of professionally trained foresters. The role of the Forest Service in those early years was perforce primarily custodial.

Then, with the advent of the Great Depression of the

1930's, President Franklin D. Roosevelt created the Civilian Conservation Corps to combat the waste of America's human and natural resources. With comparatively unlimited funds and labor available, the Forest Service added over 4 million acres and 15 new national forests in less than 3 years.

Corps enrollees brought the South's forests back to life, planting millions of trees; battling fires, floods, and erosion; and building roads to open the back country to fire control and public recreation.

In July 1934, the Forest Service's Southern Region was established, with its headquarters in Atlanta. Professional foresters were assigned to supervise Corps camps and projects; and as the number of foresters increased, an understanding of the southern pineries increased as well.

Experimentation with the planned use of fire as a timber management tool progressed during the

1930's and culminated in Chief Lyle Watts' issuing a policy statement in 1943 endorsing its use.

World War II demands for manpower ended the Corps in 1942. Loss of men and money reduced the Forest Service management activities during the war to the custodial management typical of the 1920's.

At the close of the war, the National Forest Reservation Commission (U.S. Congress, Senate 1946) said of the national forests:

The war is won and the country can now turn its energies to peaceful pursuits, among which must be the conservation and rebuilding of its natural resources which are the bases of its prosperity and strength. In this effort the extension and consolidation of the

national forests as provided by the Weeks Law and allied acts can play a large and useful part.

The task of building the national forests into useful public properties and effective instruments for conservation and increased production of forest resources is well begun; it should be promptly resumed and diligently carried forward.

In the interest of the war effort, the cut on some of the forests had been increased beyond the annual allowable cut budgeted for the period. Yet the southern national forests began the post-World War II period with a pine and hardwood sawtimber inventory of 13.8 billion board feet (Behre and Hutchinson 1946).

National Forest Resources in Transition (World War II to 1970)

The years before World War II saw establishment of many of the South's national forests. Labor and funds had been directed to organization, land acquisition, fire protection, tree plantings, and timber stand improvement, mostly regeneration release and cull removal work.

In the policy statements, development plans, and timber management plans from early working circles, the primary objectives were (1) fire protection; (2) removal of cull, defective, and overmature trees; and (3) regeneration of the lands denuded by wildfire and heavy cutting by prior owners.

The basic purpose of those early management activities was watershed protection, restoration of the productive capability of the land, and establishment of new stands of timber. Sales of timber were largely so-called improvement cuts (removal of residual overstory and defective trees, salvage of overmature trees) and

sanitation cuts (intended to improve stocking and growth of seedling, sapling, and pole stands).

Silvicultural systems were modified selection cuts, more aptly termed selective cuts. They were intended to achieve the foregoing stand-improvement objectives and set the stage for future long-term sustained yield of timber and other renewable forest resources.

Although management before the war had been described as generally custodial, the beneficial results of those efforts were evident following the war in the improved stocking and growth of both softwood and hardwood stands. Attention turned to the need to manage more intensively large areas of pine plantations, many of which already contained pulpwood or small sawtimber-size trees, and extensive second-growth natural stands of softwood and hardwood timber.

Regeneration Comes to the Fore

Managers previously worried about adequate stocking of desired species. Now they had to address stocking controls and thinning regimens and regeneration of second-growth stands now approaching maturity to ensure sustained yields of timber in a steady flow.

This meant working toward establishing a balanced system of age classes, classifying site quality for various timber species, and applying prescribed silvicultural systems designed to achieve full productivity of those sites--all in keeping with management objectives that stressed multiple use of the resource. The changes in management emphasis and intensity that followed were questioned and even seen as controversial inside and outside the Forest Service. Stage two in the development and management of the southern national forests had begun.

On the Francis Marion National Forest in South Carolina, large areas of second-growth loblolly and longleaf pine were reaching

the age and condition where management had to consider regeneration over substantial areas. Under the direction of Forest Supervisor Roland J. Riebold, the Francis Marion became in 1950 the first national forest in the country to adopt even-aged management and regulation entirely by area. Other national forests followed suit as new management plans were developed or old ones revised.

Not until 1963 did even-aged management become a matter of policy and direction for the southern national forests. That turning point was rounded at the Southern Region's 1963 Even-Aged Management Training Conference, following national direction from the Chief's office in a 1962 policy statement developed by Donald J. Morris, a former supervisor of the National Forests in North Carolina.

In the interim, a number of national forests continued marking and selling timber in accordance with the silvicultural guidelines in earlier management plans, particularly in hardwood and other stands containing several size or age classes. However, in the 1950's, before Donald Morris's

move to the Washington office of the Forest Service, the Pisgah and Nantahala National Forests implemented a policy of even-aged management for most hardwood species.

During the shift toward even-aged management, the demand for and value of pine timber increased, the productive quality of forest sites was determined, and new forest inventories were completed. Before many parcels came under Federal management, frequent fires and insect and disease attacks had effectively altered their tree species from softwoods to hardwoods. The Forest Service determined that many such sites were actually better suited to growing pines than to supporting hardwoods. New silvicultural prescriptions and the associated cutting practices emphasized the release of pine reproduction on those sites. This was to be accomplished by removal of competing hardwood species less suited to such sites and by regeneration cuts designed to replace hardwood species with pine. With this expansion and intensification of timber management activities came criticism from wildlife interests, particularly

hunters, recreationists, and even some foresters.

Seven years after World War II, the commercial forest land area of the southern national forests was 10,369,000 acres, of which some 454,738 acres had been regenerated by planting and seeding and by prescribed burning or other artificial means to obtain natural seeding. Pine types covered 4,002,000 acres, mostly in the Coastal Plain forests; mixed pine-hardwoods, 338,000 acres; bottomland hardwoods, 346,000 acres; and upland hardwoods, 4,121,000 acres, mostly in the mountain forests. The inventory of softwood growing stock was estimated to be 4.975 billion cubic feet (roughly 25 billion board feet), and the hardwood growing stock inventory was estimated to be 3.951 billion cubic feet (roughly 19.8 billion board feet). Average volume per acre, including both softwoods and hardwoods, was 861 cubic feet, or about 4,305 board feet, (USDA Forest Service 1985b and 1985c, unpubl.)

Net annual growth ranged from 23.2 cubic feet (116 board feet) per acre in the Florida national forests to 68 cubic feet (340 board

feet) per acre on the Texas national forests (USDA Forest Service 1985c, unpubl.) These estimates indicate a substantial improvement in growth rates in less than 20 years. Policy statements and management plans in the 1930's showed net annual growth rates as low as 14 board feet in stands having a sawtimber volume of 1,000 board feet or more per acre. Although approving one working circle's timber management plan for 1941-51, the Chief's office commented that the expected pine growth of 112.4 board feet per acre per year might be a little high (USDA Forest Service 1938b, unpubl.).

The timber harvest in 1952 was 504,973,000 board feet, and 40,760 acres of timber-producing lands were regenerated to desirable timber species by planting, seeding, and other artificial measures. Timber stand improvement work to improve the growing condition of established stands was done on another 215,483 acres.

Controversy Builds

As the country returned to a peacetime economy, with a pause during the Korean

conflict, national forest managers were not the only people aware of the rapidly increasing volume and value of the timber being grown on national forest lands acquired and placed under management less than 40 years previously, most of it not even 20 years earlier. With the support of Congressmen and key constituents in congressional districts where Louisiana's Kisatchie National Forest and the National Forests in Texas were located, proposals were made in the late 1940's and early 1950's to break up and sell the national forests to private parties. One such proposal would have sold 40-acre parcels by lot. A "forty" was an easily identified and understood land unit in the general land survey States but less readily visualized by prospective purchasers of the scattered irregular metes and bounds tracts of national forest land in the other Southern States. The proposals eventually died, apparently for lack of public support, until revived 30 years later in another administration.

For all these reasons, the period was characterized by tension. Timber stand improvement work, particularly hardwood

removal for release of pine reproduction, was widely criticized by wildlife interests, who feared that more widespread conifer forests would hurt the deer, squirrel, and turkey populations and potential game harvests. In Alabama, certain critics attributed a deer die-off from a virulent disease to the use of a granular herbicide to kill undesirable hardwoods for the release of pine. An outdoors writer stated that extensive hardwood defoliation by an outbreak of the elm spanworm in the Chattahoochee National Forest in north Georgia was actually due to an overzealous young forester who allegedly introduced the insect to aid in control of the hardwoods on pine sites.

The turmoil created by the controversy among Forest Service foresters, wildlife biologists, and administrators on the one hand and local officials, hunters, and other private wildlife interests on the other hand was, in retrospect, a harbinger of the all-out conflict that developed in the environmental arena of the late 1960's and 1970's.

New Legislation of the Sixties

As in the case of fire prevention, Forest Service timber management policies and practices and public education efforts may have been more successful than understood by the general public. New and vigorous stands of trees on previously denuded lands and larger wildlife populations may have been viewed as concrete evidence that the exclusion of fire from the woods and "selective" cutting were the proper means by which national forest timber, wildlife, and other renewable resources would be perpetuated. These changes in national forest timber management policy and practices may have been construed as contradictions of good forestry and what the Forest Service had been preaching and doing for nearly 40 years. Whatever the public rationale, timber management on the southern national forests following World War II played a major role in the chain of national events leading to passage of the Multiple Use Sustained Yield Act of 1960, the Wilderness Act of 1964, the Forest and Rangeland Renewable Resources Planning Act of 1974, and

the National Forest Management Act of 1976.

The Multiple Use

Sustained Yield Act--The decade of the sixties was ushered in by the Multiple Use Sustained Yield Act, which became law on June 12, 1960. Although multiple use and sustained yield of renewable resources had been management policy and a criterion for national forest management for years, they now had the legitimacy of congressional policy and mandate. Though defined by law, the two terms remain subject to situational interpretation by professionals and laymen alike.

Conflicts Between Wildlife and Timber Interests

--Even as the Multiple Use Sustained Yield Act became law, the Southern Region was acting to resolve the problems encountered where timber management activities conflicted with wildlife interests. Also in June 1960, the Chattahoochee National Forest in Georgia and the Apalachicola and Ocala National Forests in Florida hosted a Servicewide workshop on wildlife-timber management coordination. After that meeting, the Region developed and implemented its

wildlife-timber coordination guidelines and handbook. That handbook became the model for coordination of wildlife and timber management activities on all of America's national forests.

Rotations Become

Shorter--As mentioned earlier, the Region moved to even-aged management early in the sixties. As area regulation took hold and efforts began to achieve a measure of balance in age classes, the total area scheduled for regeneration cuts in the 10-year period increased. Better inventories of growing stock and better information on growth rates in managed stands indicated that timber yields could be increased with shorter rotations and more intensive stocking controls.

Rotations that had ranged from 80 to 120 years according to old policy statements and management plans were adjusted downward. Cutting budgets and timber sale plans in the thirties had been based on cutting cycles as long as 40 years for some of the mountain forests. Now the norm was 10 years. Rotations were reduced to 60 years for most of the southern pine (yellow pine) types and 89

to 120 years for most hardwood types (USDA Forest Service 1985a, unpubl.) (Five-year cutting cycles had been tried for plantation thinnings on several forests but discarded largely due to fluctuating markets for small roundwood, the small volumes produced, and the high costs of tree marking and timber sale administration for the more frequent entries into the plantations.)

Volume and Value of Harvests--In 1962, the reported volume of timber harvested from the southern national forests was 803.579 billion board feet, with a value of \$16,840,602. This represented a 98-percent increase in the annual volume harvested and 530-percent increase in value received over 1945's reported cut of 405.229 billion board feet worth \$2,673,553. In the period 1945-62, commercial forest land area of the national forests increased 574,000 acres, from 10,138,000 acres to 10,712,000 acres--a 5.7-percent increase. During that same period 681,730 acres had been regenerated to new stands by planting, seeding, and prescribed burning, plus other artificial methods to obtain regeneration--an average of

40,102 acres annually, or roughly 6.4 percent of the commercial forest land (USDA Forest Service 1985b, 1985a, unpubl., and 1985c, unpubl.).

Tree Improvement Program--The Southern Region initiated its tree improvement program in 1959 under the leadership of Thomas F. Swofford. With the cooperation of geneticists, pathologists, and other scientists from Forest Service Research, the program advanced rapidly through a series of intensive training sessions for national forest timber staffs to establishment of seed-production areas in carefully selected stands of quality trees, development of criteria for superior tree selections, identification of superior trees, and establishment of first-generation seed orchards.

Orchards were established on the Francis Marion National Forest in South Carolina, the Nantahala in North Carolina, the DeSoto in Mississippi, the Kisatchie in Louisiana, and the Ouachita in Arkansas. Clones of sand pine from Florida's Ocala National Forest were first included in the Erambert Seed Orchard on the DeSoto. Because of

poor survival and growth, the sand pine orchard was later moved to the Ocala.

The pine program that began with the first selections in 1961 was essentially completed by 1967. The original selections recognized 38

species-geographic source combinations consisting of loblolly, longleaf, sand, shortleaf, slash, Virginia, and eastern white pine. The hardwood program started in 1968 contains black oak, white oak, northern red oak, chestnut oak, cherry, and yellow-poplar selections (Kitchens 1985).

The original objective of the tree-improvement program was the eventual replacement of existing timber-producing stands with improved trees from superior tree selections. That objective proved to be more idealistic than practical or realistic and was modified a few years later to recognize the role of natural regeneration for many stands and sites.

The Wilderness Act--On September 3, 1964, the Wilderness Act was passed. By that act the Linville Gorge Wild Area in the Pisgah National Forest was legally designated a Wilderness.

The stage was set for the Eastern Wilderness Act of 1975 and Roadless Area Reviews I and II. Those acts and reviews were to have a significant impact on the area of commercial forest land in the national forests.

Harvests Increase--Within the decade though, annual timber harvests continued to increase steadily in spite of market fluctuations. The volume of timber sold in 1 year passed 1 billion board feet in 1970. By the end of that year, the annual timber harvest was approaching 1 billion board feet from the 10,764,000 acres of commercial forest land still open to timber production. The value of the 921,923,000 board feet harvested that year was \$23,946,596 (USDA Forest Service 1985a, unpubl., and 1985c, unpubl.).

Of nearly 1.5 million acres successfully regenerated by artificial means since 1933, over 1 million acres had been planted or seeded, mostly to pine. During that same period, approximately 6 million acres of growing timber stands had been released, precommercially thinned, pruned, fertilized, or prescription burned for understory species control

(USDA Forest Service 1985b).

Net annual softwood growth had reached an apparent peak of 363 million cubic feet in 1970, but the

hardwood net annual growth had risen to 222 million cubic feet per year and apparently was still increasing (USDA Forest Service 1985c, unpubl.).

National Forest Resources in the Public Eye--1970 to the Present

The National Environmental Policy Act

On January 1, 1970, the National Environmental Policy Act (P.L. 91-180) was enacted. It presaged environmental legislation in the 1970's that was to alter the process of managing the national forests as significantly as all forest resource legislation in the prior 65 years.

Before 1970, even-aged management, clearcutting, and road building in previously unroaded areas had not been environmental issues of great impact on management of the southern national forests. But the National Environmental Policy Act required environmental analysis of the impacts of resource management decisions and public review of the supporting environmental impact statements. This requirement afforded interested parties additional opportunities to criticize and oppose timber management activities, particularly those involving timber sales perceived to

affect other resource uses adversely.

The Endangered Species Act

On December 28, 1973, the Endangered Species Act became law. Its purpose is to provide for the conservation of endangered and threatened species and the ecosystems on which they depend.

Of the several endangered or threatened plant and animal species found on the southern national forests, the red-cockaded woodpecker has had the greatest impact on timber resources. The range of the woodpecker extends from eastern North Carolina to eastern Texas. Over 2,000 active colonies, at least three-fourths of the total population, live in the pine stands of national forests in North Carolina, South Carolina, Florida, Alabama, Mississippi, Louisiana, and Texas. The Forest Service's red-cockaded woodpecker recovery plan concludes that 125 acres of well-stocked pine stands 30

years of age and older are needed to sustain a single colony. As a result, over 250,000 acres of mature southern pine timber are currently subject to management restraints to favor this species. Curtailment of harvesting is expected to reduce timber sales over 200 million board feet annually if rotations are extended beyond 80 years. The goal of the recovery plan is to double the Nation's red-cockaded woodpecker population, to over 4,000 colonies (USDA Forest Service 1985a).

The RPA Assessment and Program

The Forest and Rangeland Renewable Resources Planning Act was enacted on August 17, 1974. Known as the RPA, this act directed the Forest Service to make an assessment of renewable resources on all the national forests.

It was amended and supplemented by the National Forest Management Act of 1976. The first assessment, due at the end of 1975, was to be updated in 1979 and every 10th year thereafter. The act also required the agency to develop a renewable resources

program not later than December 31, 1975, to cover the 4-year period after October 1976 and the following four decades inclusive.

The results of the initial and subsequent assessments and the timber resource management opportunities and alternatives available to the national forests are reflected in (1) the final environmental impact statement and the resource planning standards and guidelines issued by the Southern Region in 1982 and (2) the land and resource management plans developed by the respective forests.

The Eastern Wilderness Act

Enacted January 3, 1975, the Eastern Wilderness Act authorized adding to the National Wilderness Preservation System areas from national forest lands in the Eastern States. It designated and added to the system approximately 115,117 acres in nine national forests in Alabama, Florida, Georgia, North Carolina, South Carolina, Tennessee, and Virginia.

This legislation was a significant departure from

the concept of wilderness as provided in the Wilderness Act of 1964. It designated areas of less than 5,000 acres as wilderness and wilderness study areas. It also provided for incorporating into the Wilderness Preservation System areas that did not meet the earlier criteria as "an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain."

Nine subsequent wilderness acts increased the number of wildernesses at the end of 1984 to 60 and the area to 522,737 acres. Some of these areas had been cut over, burned over, or occupied by local citizens for years prior to acquisition for the national forests. On some of the areas, there had been timber sales, roadbuilding, and cutting within the previous 30 years. Designated and proposed wilderness encompassed significant areas of commercial forest land and stands of timber that were part of the timber resource base for sustained-yield production.

Court Actions and the National Forest Management Act

In the early and mid-1970's, court actions emanating from the clearcutting controversy about even-aged management and timber-harvesting activities in the Monongahela National Forest in West Virginia had curtailed timber sales on the national forests in Virginia, North Carolina, South Carolina, and Texas. In its August 21, 1975, decision, the U.S. Court of Appeals for the Fourth Circuit upheld the November 4, 1973, decision of the Federal District Court in Elkins, WV, in the case of Izaak Walton League v. Butz, et al. That decision limited the sale and harvest of national forest timber to dead, mature, or large-growth trees. This and other injunctive actions came at a time when demand was high, stumpage prices were up, and the southern pine beetle was making another run in several areas of the South.

Relief of a sort came with passage of the National Forest Management Act of 1976, which opened the way to continue the sale of timber. But at the same time, this legislation required

the Forest Service to develop a process to devise and revise its land management plans. The agency was directed to set forth guidelines for managing the timber and associated forest resources to ensure that timber would be harvested from National Forest System lands only where specified by the act.

Clearcutting, seed-tree cutting, shelterwood cutting, and other cuts designed to regenerate an even-aged stand of timber could be done only under the conditions specified in the act. With exceptions for thinning and other stand improvement measures, salvage and sanitation cuts, and cutting of a particular species in management units for the benefit of other resources, the act required the establishment of standards to ensure that timber stands would not be harvested prior to culmination of mean annual increment.

Forest Plans as a Management Tool

Since establishment of the national forests, the timber management plan had been the primary vehicle by which resource management activities were

coordinated to ensure that all resources would benefit. Now each national forest was required to have a comprehensive National Forest Resource Management Plan. This meant that all existing timber management plans were to be revised and incorporated into the new forest plans developed and approved pursuant to the new guidelines prescribed by the Renewable Resources Planning Act, as amended by the National Forest Management Act.

By the end of fiscal year 1985, nearly 10 years later, 13 final Land and Resource Management Plans had been approved and implemented--one for each of the region's national forests except the Nantahala/Pisgah National Forests and the National Forests in Texas. They were targeted for completion by August 1986 and January 1987, respectively. In all, 49 appeals had been filed; 17 were closed and 32 were pending.

In the interim, timber management activities continued under modifications and extensions of the old timber management plans, reflecting changes in the area of commercial forest

land open to timber production under the new guidelines. Timber sales planned in or adjacent to areas proposed by various private interests for wilderness designation or other nontimber use have been the subject of numerous injunctive actions. These injunctions are sought by parties who view timber sales as being in conflict with other resources and uses they regard as more important or valuable than timber production. Despite these legal interventions, timber sales and cut from the national forests have been maintained at a relatively stable level, but with only a slight increase in volume harvested each year over

that in 1970 (the average being slightly more than 1 billion board feet).

As of this writing, some 11.4 million acres (approximately 95 percent of the net national forest areas of 11.9 million acres) were classified as commercial forest land. Of the area classified as commercial forest land, only 8.8 million acres (approximately 75 percent of the national forest land in the South) is currently suitable for timber production. The cut in 1984 was 1,243,553,000 board feet, for which the Forest Service received \$104,279,053 (USDA Forest Service 1985a, unpubl., and 1985c, unpubl.).

Summary: 75 Years (1911-85) of National Forest Establishment and Management

The era of large acquisitions of forest land for the national forests is over. Since 1940, about 1,709,000 acres have been added to the national forests in the 12 States included in this study.

Timber stands in the 33 proclaimed national forests are representative of nearly every forest type in the region. Except for a nucleus of reserved public domain lands in Alabama, Arkansas, and Florida, most of the lands had been cut over. Practically all the lands had suffered from repetitive wildfires, and most were nonstocked or understocked at time of acquisition. Site quality for timber production was relatively low, particularly in the national forests of Appalachia and the Piedmont. Yet these lands now support a softwood (mostly pine) and hardwood inventory of 16.5 billion cubic feet. Current growth rates are estimated to average 57 cubic feet per acre per year.

Since 1923, 34.8 billion board feet of timber have been harvested from these

national forests. Over \$1.1 billion has been paid into the Treasury of the United States for that timber.

Over 2 million acres have been regenerated to timber-producing species, mostly pine, by planting and seeding. Approximately 90,000 acres of commercial forest land are regenerated each year by natural and artificial methods. Genetically improved seed and planting stock are used on all artificially regenerated pine sites. As the Southern Region's tree-improvement program advances into its second-generation orchards, volume growth in the new pine plantations is expected to increase 25 to 30 percent.

Debate continues on the issue of even-aged versus uneven-aged silvicultural systems and the regeneration cutting methods associated with the respective systems, particularly in the hardwood types. Even with the extensive use of clearcutting for regenerating both pine and hardwood stands, the

proportion of commercial forest land in pine and that in the mixed pine and hardwood types has been relatively stable since 1952. The area in the pure pine types has ranged from 37 percent to 40 percent of the national forests' commercial forest land base. Probably the most significant change has been the 36-percent reduction in the area of the bottomland hardwood types. However, that decrease has been more than offset by increases in the other hardwood types.

Certain interests in the public sector continue to pressure Congress to designate additional areas for wilderness and other nontimber uses. Similar pressures are being exerted on the Forest Service through the land and resource management planning process and the courts to reduce the use of clearcutting for stand regeneration and to lengthen rotations, ostensibly to enhance nontimber resources and uses. If such changes in management come about, their effects on future timber yields remain to be seen. The Southern Region has targeted 1.3 billion board feet of timber for sale

annually over the 10-year period 1986-96.

The impact of the national forests on the South's timber resources cannot be measured or evaluated solely by the volume of timber produced on those lands during the last 75 years. National forest timber production, although substantial, constitutes a relatively small proportion of the total output in the South for that period and today. National forest timber resources in the South should be viewed from the perspective of fulfilling the purposes for which those forests were established and have been managed.

The underlying purpose of the Weeks Law was the acquisition of sufficient areas of mountainous nonagricultural land to be influential in protecting the watersheds of navigable streams from the effects of forest fires and destructive timber cutting and other land-use practices. As a result of aggressive fire-protection and timber management programs, new to the South at inception, well-stocked and well-managed stands of trees now protect those lands from erosion while producing timber and providing recreation, wildlife,

and other forest resource benefits.

That management of the lands acquired for timber production under the authority of the Weeks Law, as amended in 1924, has met and is meeting this purpose is evident from the productive forest condition of those lands and the quantities of timber they are providing.

A third purpose of national forest establishment and management was the demonstration of proper forest and land resource protection and management. In its final report in 1977, the National Forest Reservation Commission said:

When the Weeks Law acquisition started, there was no organized forest protection in the Eastern United States and land conservation and rehabilitation programs had not been devised. For the most part these programs had their inception on National Forest land and achieved acceptance and

widespread adoption by virtue of their demonstrated benefits on the public lands.

From a public-use standpoint, probably the most significant impact of the southern national forests on the South's timber resources and future management of those resources has been and is the demonstrated capability of properly managed forest lands to produce large volumes of high-quality timber in combination with other forest resources. Providing over 23 million visitor-days of recreation annually for hunters, fishermen, sightseers, hikers, campers, and other users of the forests' nontimber assets; the critical habitat for several threatened, endangered, and sensitive plant and animal species; wilderness and natural areas; research areas; water for domestic and industrial uses; forage for domestic animals; and timber, these forests are examples of successful multiple-use, sustained-yield forest resource management.

Epilogue

Those instrumental in the establishment of the first eastern national forests had a vision of restored forests perpetually contributing to the basic needs of a developing nation. That vision has largely been fulfilled. But society and

its needs have changed dramatically since these forests were established, creating new and increasing demands upon the forest (Shands and Healy 1977, p 18.)

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